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ABSTRACT

The systematic approach to teaching provides a method for the functional organization and development of instruction. This method applies to preparation of materials for classroom use, as well as for print and non-print media. Inputs to the systems approach include well defined objectives, analysis of the intended audience, special criteria desired by the customer, analysis and use of existing resources, and a team of instructional system specialists, subject matter experts, writers, and visual specialists. Outputs are functional relations trees, functional block diagrams, a teaching sequence chart, and frames (a combination of words and visuals on a specific topic from the teaching sequence chart). The three step production flow consists of content requirements, content development, and use. Material is divided into levels of detail, so that the student studies only until he has reached the level he needs. At each level of detail, the material is treated as a whole, then in its parts, and finally recombined into a functional whole. Visuals illustrating the concepts are included. (EMH)

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A SYSTEMS APPROACH TO TEACHING

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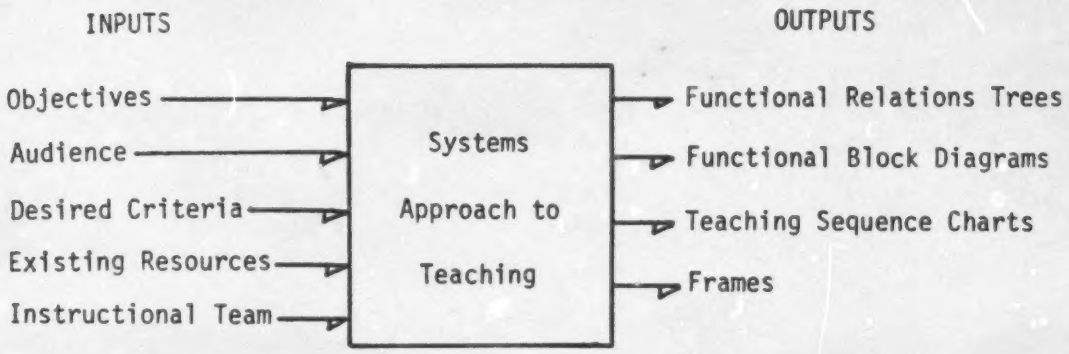
AECT National Convention
30 March, 1976

IR 003 577

SYSTEMS APPROACH TO TEACHING

Purpose: The purpose of the systematic approach to teaching is to provide a method for the functional organization and development of instruction. This method applies to preparation of materials for use in the classroom as well as for print and non-print media.



Inputs: The inputs to the systems approach to teaching include well defined objectives, analysis of the intended audience, special criteria desired by the customer, analysis and use of existing resources, and a team of Instructional System Specialists, Subject Matter Experts, Writers, and Visual Specialists.

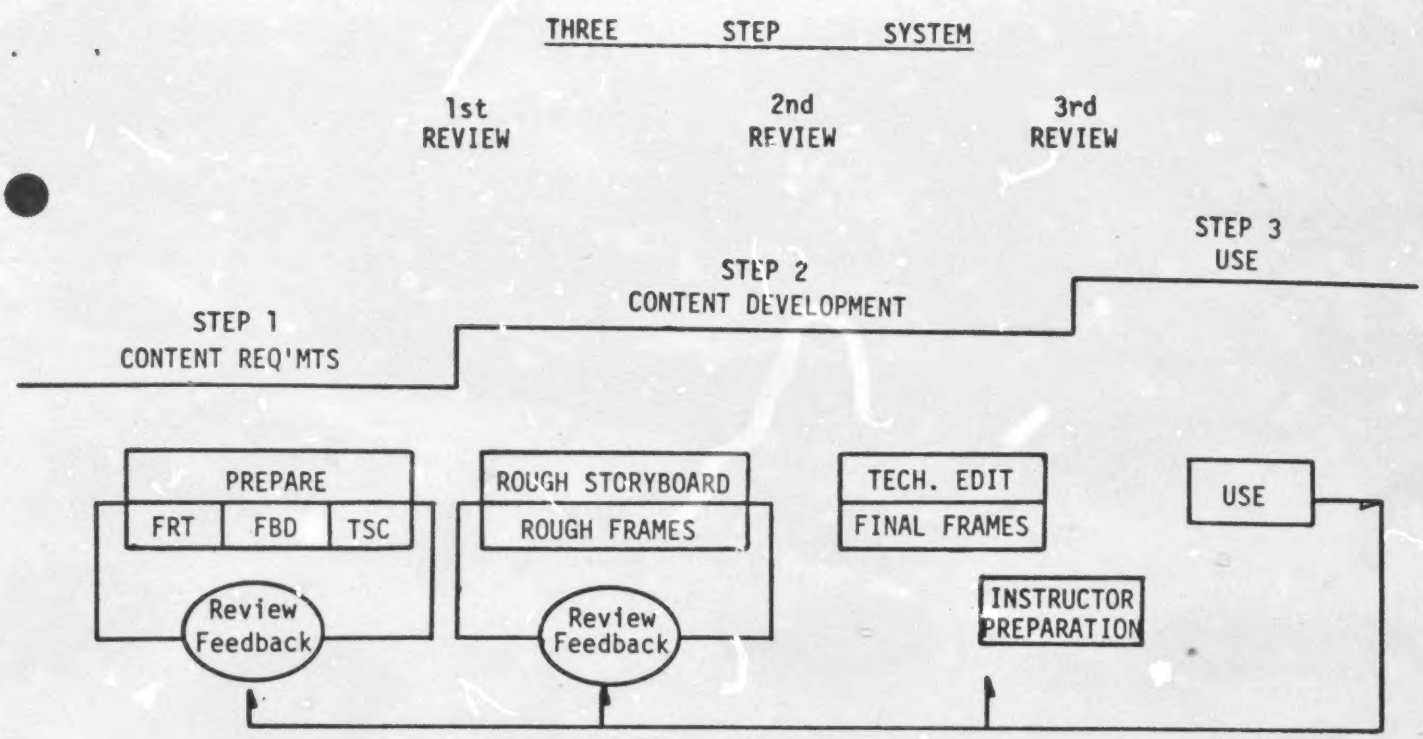
Outputs:

1. Functional Relations Trees - Identify, organize and classify all instructional components into functional groupings.

2. Functional Block Diagrams - Identify the inputs and outputs as well as the interrelationships of all components and component groups.

3. Teaching Sequence Chart - Describes a logical flow for presenting the instructional materials, as well as a tool for troubleshooting instruction when problems are identified.

4. Frames - Are a combination of words and visuals that address a specific topic from the teaching sequence chart, also, data presented in each frame can be used in the classroom or in print or non-print media.



Production: The system approach to teaching follows a three step production flow.

Step One Content Requirements:

Is the preparation of the functional relations tree, functional block diagrams, and the teaching sequence charts. This step also includes reviews and feedback loops.

Step Two Content Development:

Is the production of frames required to complete the teaching plan as outlined by the teaching sequence chart. Software is produced in the desired media. Reviews, feedback loops, and instructor preparation time also occur.

Step Three Use:

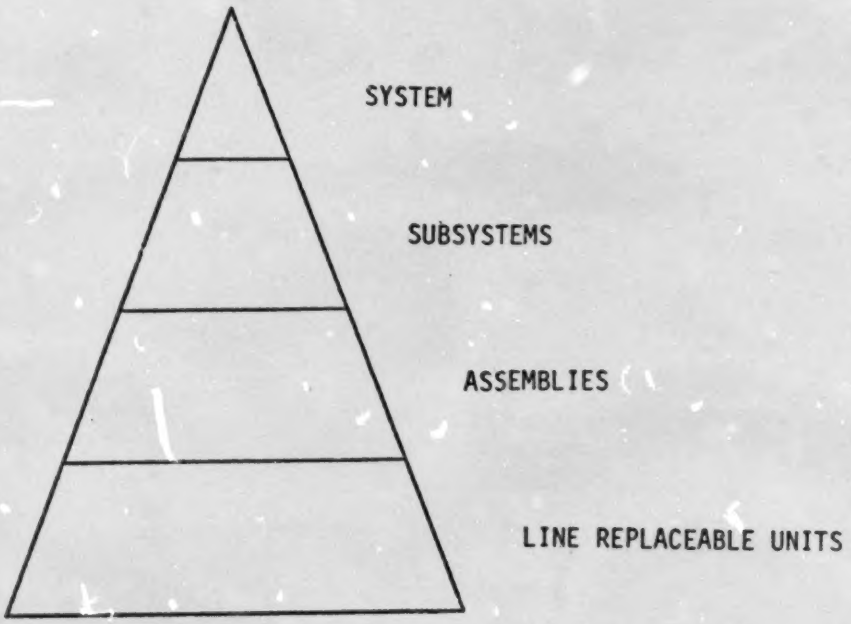
The teaching media is used in the learning environment. Again, review and feedback loops are incorporated to update the instruction as required.

Concepts: Incorporated in the systems approach to teaching are the following concepts:

Need to Know: What does the student need to know to complete his intended task? For example: If a student is to (1) identify, (2) remove and (3) replace defective components, the students needs to know how to determine if the component is defective, how to remove the component, and how to replace it with a new component. The student may also need some general information on the internal operation of the component. However, the student does not need to know detailed information on the internal operation of the component.

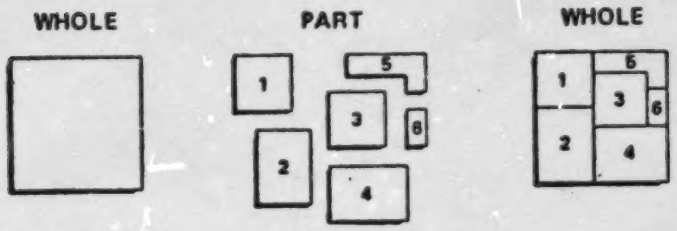
Levels of Detail: To help provide for a need to know presentation of instruction, all materials are developed by levels of detail. The levels of detail can be defined to meet the needs of the instruction. For example: An airplane can be divided into systems, which are then divided into subsystems, subsystems are in turn divided into assemblies, and each assembly is divided into line replaceable units. These terms are common throughout the airplane industry. The human body can be divided using similarly accepted terms. For example: The body can be divided into systems (nervous, respiratory, excretory, circulatory) each system can be divided into organs (heart, lungs, brain) and so on. A stream could be called a system and divided into the subsystems of animals, plants, soil etc. The plant subsystem could be divided into phylyms, the phylyms divided into classes, and so on.

Using the airplane for example: Instruction would start at the system level, then proceed to the subsystems after covering all the subsystems each subsystem would be divided into assemblies. All assemblies would be covered in each subsystem before proceeding to a lower level of detail. This top down approach allows a cross section of students to begin instruction at one time. As the instruction proceeds to more detail, students that do not need to know more information may depart from the instruction sequence at the level of detail they need to know.



LEVELS OF DETAIL

Whole Part Whole: The whole part whole method of organization and structuring subject content consists of taking a specific subject area and first treating it as a "whole" in terms of its fundamentals and interrelationships. Second, the subject area is then broken down into its constituent "parts". Finally, it is recombined into its functional "whole". This method is followed at each level of detail.

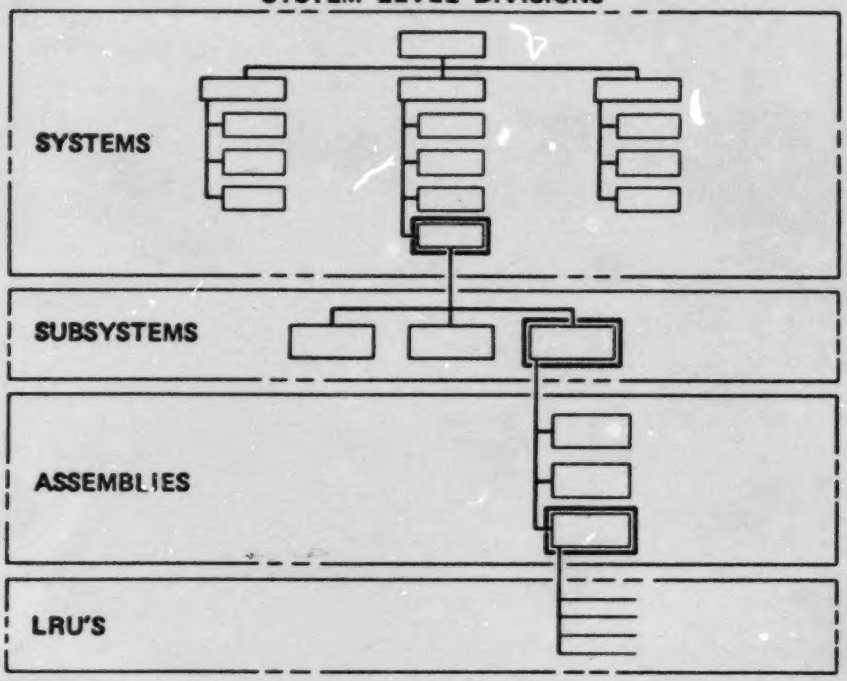


CONCEPT VISUALS

On the next few pages are some visuals that will help explain the concepts of the systems approach to teaching.

1. A generalized functional relations tree identifying the systems, subsystems, assemblies and LRU's.
2. System level functional block diagram
3. Subsystem level functional block diagram
4. Assembly level functional block diagram
5. LRU level functional block diagram
6. A sample information box from a teaching sequence chart
7. A sample teaching sequence chart
8. Frame concept

SYSTEM LEVEL DIVISIONS



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1.0 SYSTEM

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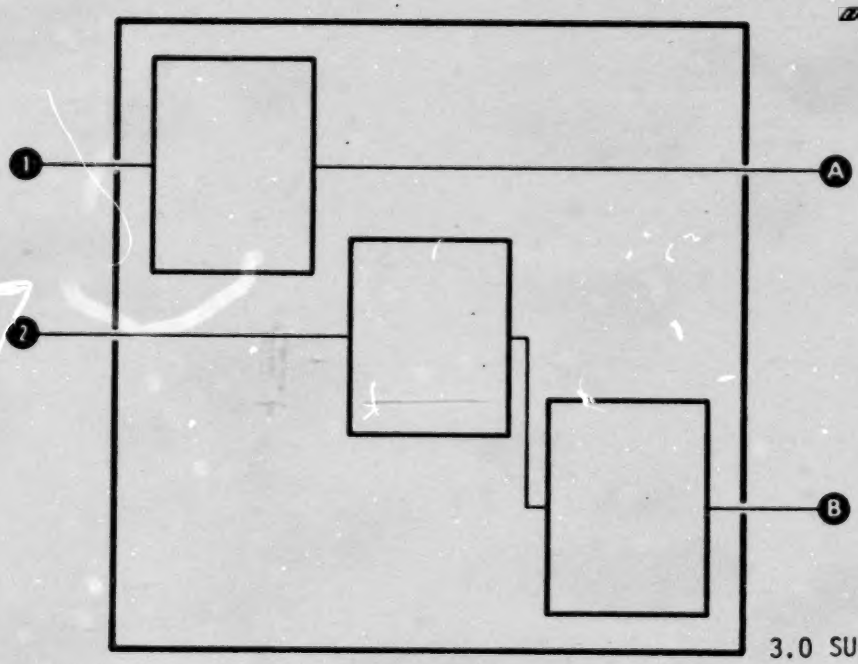

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3.0 SUBSYSTEM

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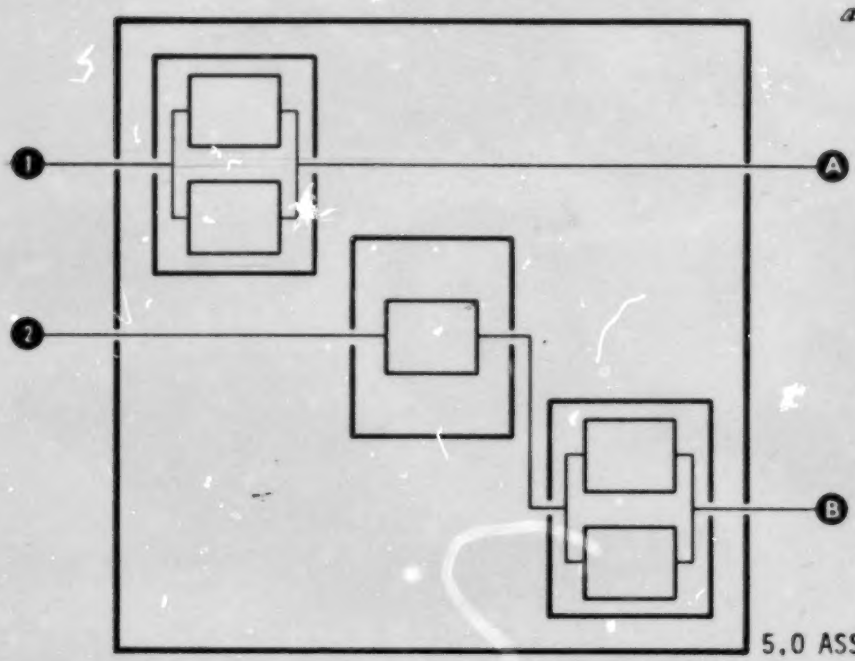

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5.0 ASSEMBLIES

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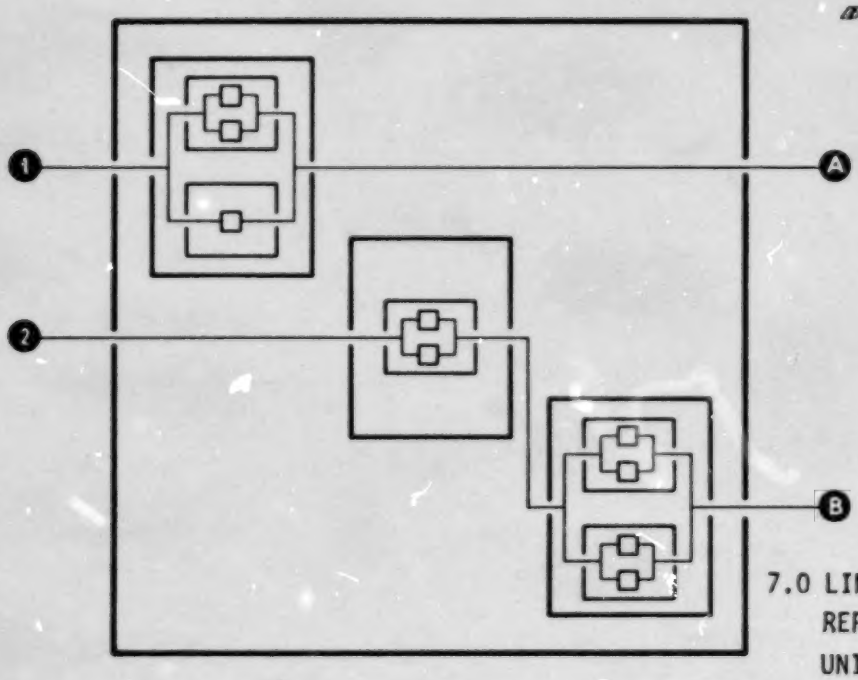

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7.0 LINE REPLACABLE UNITS

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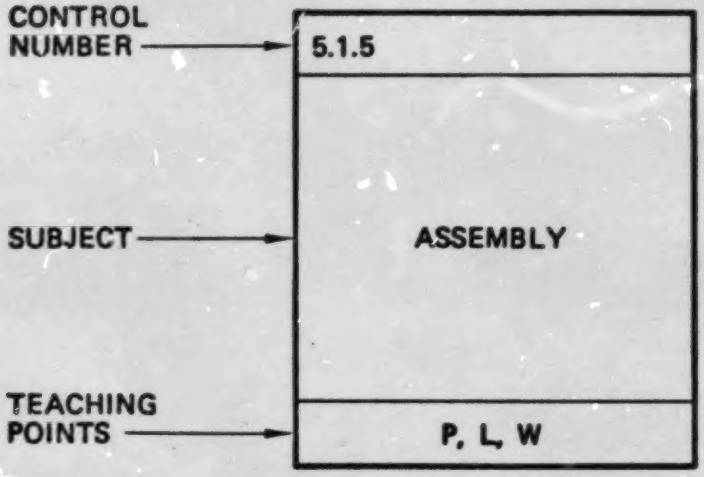

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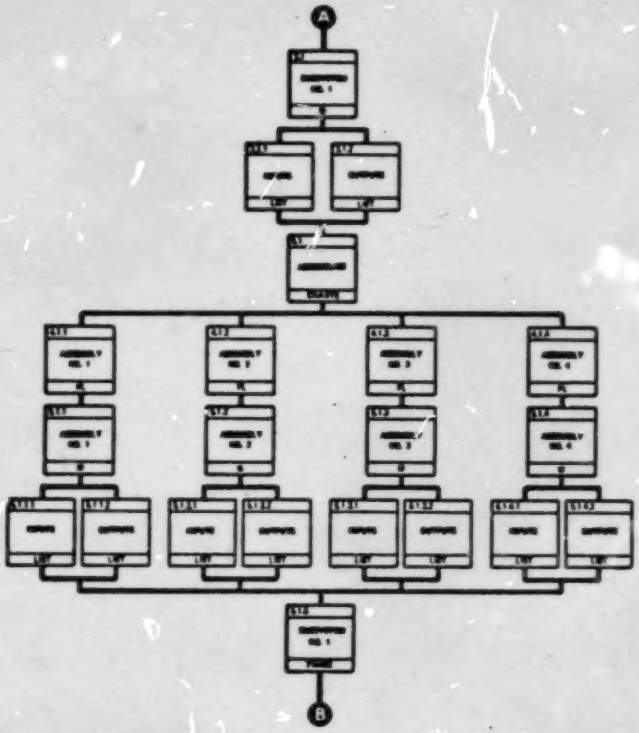

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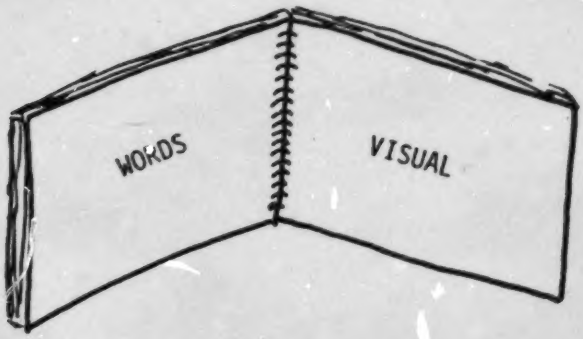
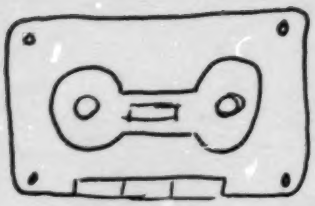
FRAME CONCEPT

"SAME CONTENT MANY MEDIA"

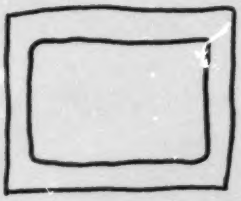
PRINT



NON-PRINT



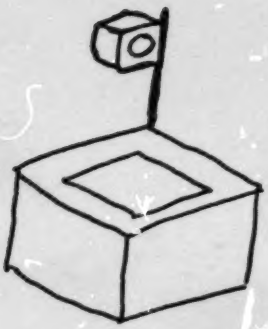
CASSETTE



SLIDES OR
FILMSTRIP

CLASSROOM

INSTRUCTOR



OVERHEAD